The Behavior Analyst 1987, 10, 291–294 No. 2 (Fall)

On Terms

The Concept of Consequences in the Analysis of Behavior

Comunidad Los Horcones
Hermosillo, Sonora, Mexico

Consequences are fundamental to the science of behavior. They are fundamental to its epistemology (Day, 1980), a subject matter for its experimental analysis (Skinner, 1966), and the basis for application (Baer, Wolf, & Risley, 1968) (see also Skinner, 1981). As fundamental as consequences are, though, the term "consequence" is not always used in a clear and consistent manner, and hence is sometimes a source of imprecision in interpretation, analysis, and application. In this brief commentary, we describe the problem, suggest a restriction in the meaning of the term that is semantically appropriate, and illustrate how the restriction facilitates and clarifies the use of related terminology (see Vargas, 1984, 1985).

The problem is basically a simple one: Consequences are too generally taken to be events that follow responses closely in time—with little additional clarification. This usage, does not distinguish between (a) events that follow responses and that are *produced* by those responses (i.e., response-dependent events) and (b) events that follow responses and that are *not produced* by those responses (i.e., response-independent events). Not only is "consequence" unclear about these formal relations, it is also not specific about what stimulus functions the events might have for responding (i.e., a reinforcing or punishing function). These problems may be resolved in the following fashion.

We would like to thank Sidney W. Bijou and Julie S. Vargas for the time and effort they gave us as we prepared and revised this manuscript. Correspondence concerning this paper should be addressed to Comunidad Los Horcones, Sociedad Cooperativa de Produccion, Carr. a Tecoripa KM 63, Apdo 372, Hermosillo, Sonora, 83,000, Mexico.

Webster's *Dictionary* (1969) defines "consequence" as "something that is produced by a cause or follows from a form of necessary connection or from a set of conditions" (p. 482). Thus, the semantically appropriate use of "consequence" accords with the first meaning above, that is, to events that are *produced* by responses. Being no more further restricted, this meaning of consequence holds whether or not the events produced have a stimulus function for subsequent responding.

Not only is Webster's first meaning semantically appropriate and terminologically more precise, but it also fits well with the meaning of another term—postcedent (Vargas, 1984, 1985). Postcedents are events that follow responding in time *whether or not* they were produced by responding. "Postcedent" is therefore a more general term covering both consequences and non-consequences. In both cases, neither term—postcedent nor consequence—implies any specific stimulus function.

INTRINSIC AND EXTRINSIC CONSEQUENCES

By restricting the use of "consequence" in this way, the operational meanings of "intrinsic" and "extrinsic" consequences become clearer and more precise. Intrinsic consequences are the natural and automatic results of responding (see Horcones, 1983; Vaughan & Michael, 1982). They are more or less inevitably produced by the structural characteristics of the physical environment and the biological organism; they are not programmed by others to occur. In contrast, extrinsic consequences occur in addition to any intrinsic consequences. They may

be programmed by our social environments, by applied behavior analysts, by researchers, and by teachers and others, but they do not occur solely as a natural consequence of responding. Although both intrinsic and extrinsic consequences are contingent upon responding, in neither case need they have a stimulus function for subsequent responding (i.e., be reinforcing or punishing). Consequences, whether extrinsic or intrinsic, may be reinforcing or punishing in function, or they may be neutral; stimulus functions are not inevitable in either type of consequence. Because this readership is already familiar with what this means for extrinsic consequences, we focus on intrinsic consequences in the remainder of this section.

Unlike extrinsic consequences, the occurrence of intrinsic consequences cannot typically be altered without intervening directly into the physical environment and/or biological structure and functioning; the natural and automatic consequences of responding will typically follow unless directly prevented. Although environments and organisms can be physically restricted (e.g., incapacitation by drugs or physically "hardening" the targets against crime) in order to minimize the occurrence of intrinsic consequences for responding, this means of control does not build effective behavior. Behavior analysts, though, do have two means for controlling the relationships between responding and its intrinsic consequences more productively. First, unconditioned stimulus functions (e.g., primary reinforcement) can be altered by various establishing operations (Michael, 1982). Second, conditioned stimulus functions can be imparted to neutral or countervailing intrinsic consequences by interrelating them with other already established stimulus functions. Let us elaborate on the latter.

The proper washing of dishes has intrinsic consequences, one of which is that dishes become clean; this consequence, however, may or may not reinforce washing dishes. In order to bring dish washing under the control of its intrinsic consequences, having clean dishes has to become a conditioned reinforcer by interrelating it with other, already extant reinforcers. When this is done effectively, the previously neutral intrinsic consequence becomes a reinforcer and enters into a subsequent controlling relationship with responding (Horcones, 1983). In everyday language, we would say that the person "likes to see clean dishes."

A CLASSIFICATORY SCHEME

Given the previous discussion, events that occur after behavior might usefully be classified according to three criteria—formal, operational, and functional (see Table 1). These criteria are described and defined below.

Formal Criteria

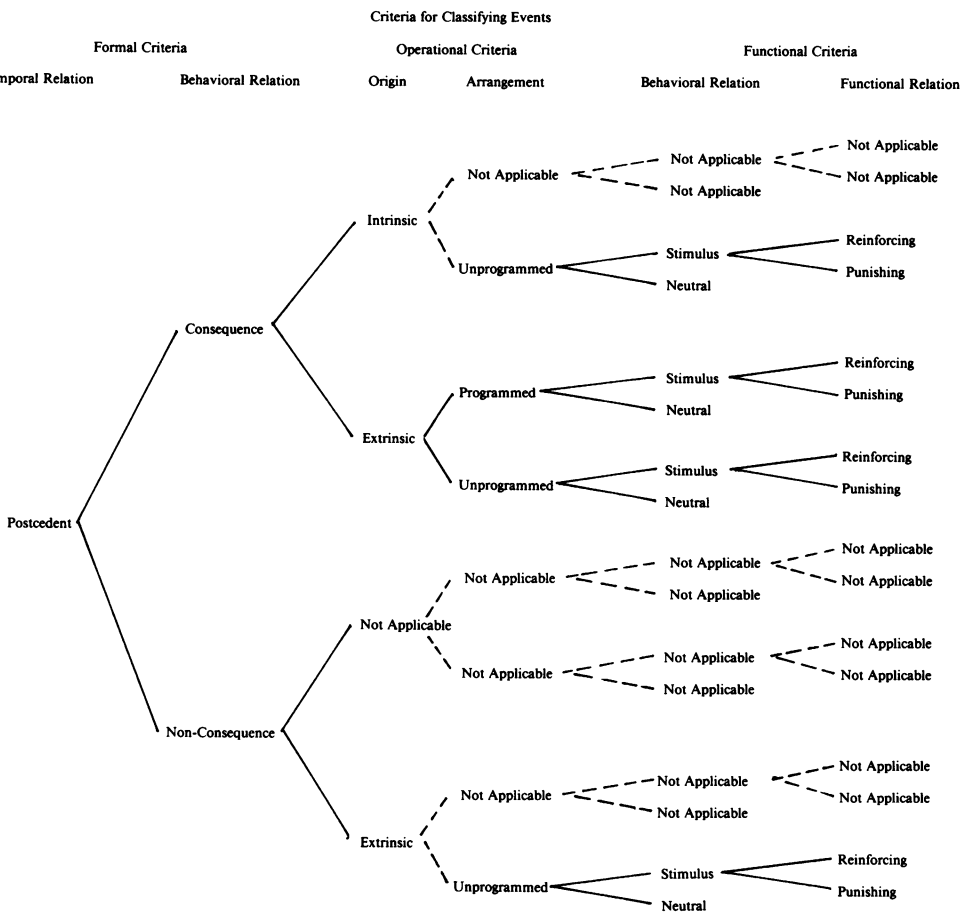
The formal criteria for classifying events that follow behavior are these: (a) An event is a *postcedent* if it occurs after behavior; postcedents may be either a consequence of behavior (i.e., a response-dependent event) or a non-consequence (i.e., a response-independent event). (b) An event is a *consequence* if it is produced by behavior and a *non-consequence* if it is not. (c) A consequence can be intrinsic or extrinsic. It is *intrinsic* if it is a natural and automatic outcome of responding; otherwise, the consequence is *extrinsic.* (d) A postcedent non-consequence is always extrinsic, never intrinsic, in that it is not produced by responding.

Operational Criteria

The operational criteria are as follows. (a) Intrinsic consequences cannot be made to occur (without intruding biologically); they occur naturally and automatically, and are non-programmed by other social agents. (b) In contrast, extrinsic consequences are programmed (or not) by others. (c) Extrinsic non-consequences (i.e., response-independent events) are, by definition, non-programmed in nature.

Functional Criteria

Finally, the functional criteria: (a) An intrinsic consequence can only be a nat-



ural, non-programmed consequence of responding; it may be either neutral in function or it may be an effective stimulus—reinforcing or punishing. (b) An extrinsic consequence may be either a programmed or non-programmed consequence of responding; in either case, it may be neutral in function or it may be an effective stimulus—reinforcing or punishing. (c) An extrinsic non-consequence is always non-programmed, and can be neutral or effective as a stimulus (i.e., a reinforcer or punisher).

CONCLUSIONS

The use of precise and consistent terminology is a prerequisite for the development of a science (Einstein & Infeld, 1938). Of all the sciences, however, behavior analysis must take particular care in this regard because the general public constantly speaks about behavior in terms that are far from precise (Hineline, 1980). Imprecision, though, also occurs among behavior analysts themselves (Hineline, 1980). In this regard, behavior analysts have sometimes commented on and urged more appropriate use of the existing behavioral terminology (e.g., Michael, 1975, 1980) and at other times have proposed new terms (e.g., Michael, 1982). In the present commentary, we are urging the former.

REFERENCES

Baer, D. M., Wolf, M. M., & Risley, T. R. (1968). Some current dimensions of applied behavior analysis. *Journal of Applied Behavior Analysis, 1,* 91–97.

Day, W. F. (1980). The historical antecedents of contemporary behaviorism. In R. W. Rieber &

K. Salzinger (Eds.), *Psychology: Theoretical-historical perspectives* (pp. 203–263). New York: Academic Press.

Einstein, A., & Infeld, L. (1938). *The evolution of physics: From early concepts to relativity and quanta.* New York: Simon and Schuster.

Hineline, P. N. (1980). The language of behavior analysis: Its community, its functions, and its limitations. *Behaviorism, 8,* 67–86.

Horcones. (1983). Natural reinforcement in a Walden Two community. *Revista Mexicana de Analisis de la Conducta, 9,* 141–143.

Michael, J. L. (1975). Positive and negative reinforcement, a distinction that is no longer necessary; or a better way to talk about bad things. *Behaviorism, 3,* 33–44.

Michael, J. L. (1980). The discriminative stimulus or SD. *The Behavior Analyst, 3,* 47–49.

Michael, J. L. (1982). Distinguishing between discriminative stimuli and motivational functions of stimuli. *Journal of the Experimental Analysis of Behavior, 37,* 149–155.

Skinner, B. F. (1966). What is the experimental analysis of behavior? *Journal of the Experimental Analysis of Behavior, 9,* 213–218.

Skinner, B. F. (1981). Selection by consequences. *Science, 213,* 501–504.

Vargas, E. A. (1984). A new term and some old advice. *The Behavior Analyst, 7,* 67–69.

Vargas, E. A. (1985). The ABP contingency. *The Behavior Analyst, 8,* 131–132.

Vaughan, M. E., & Michael, J. (1982). Automatic reinforcement: An important but ignored concept. *Behaviorism, 10,* 217–227.

Webster's Third New International Dictionary. (1969). Springfield, MA: Merriam.